GET BETTER AT PHYSICS · MARK SCHEME

Progressive Waves: tiered multiple choice

AQA A-level Physics · 7407 / 7408 · Specification 3.3.1.1 · 6 questions · 6 marks

1 mark per correct letter | Worked reasoning for every question | **How students did** = from AQA examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5	Q6
B	D	A	B	A	A

Easy

Questions 1–3

1 **B**

Length of a sonar pulse · AQA June 2019 · AS Paper 2 · Q15

$\lambda = v / f = 1.5 \times 10^3 \div 8.0 \times 10^3 = 0.1875$ m. A pulse of 12 complete oscillations is $12\lambda = 12 \times 0.1875 = 2.25$ m long.

Watch out: 0.188 m (A) is one wavelength, not the whole pulse.

How students did: Most students got this right in June 2019.

2 **D**

Reading λ and T from two graphs · AQA November 2021 · A-level Paper 1 · Q17

From the displacement–distance graph, $\lambda = 40$ m and the amplitude is 1.5 m. From the displacement–time graph, $T = 6.0$ s, so $f = 1 / 6.0 = 0.17$ Hz. (The speed is $40 \div 6.0 = 6.7$ m s^{-1}.)

Watch out: 3.0 m is peak-to-trough, which is twice the amplitude; 6 m mixes up the time axis with the distance axis.

3 **A**

Labelling a displacement–distance graph · AQA November 2020 · A-level Paper 1 · Q15

On a displacement–distance graph, w (from the centre line to a crest) is the amplitude and z (one complete cycle along the distance axis) is the wavelength.

Watch out: The period can only be read from a displacement–**time** graph.

Medium

Questions 4–6

4 **B**

Amplitude and period of a mass on a spring · AQA June 2022 · AS Paper 2 · Q14

It is pulled 10 cm from equilibrium and released, so the amplitude is 10 cm. Going from maximum displacement back to equilibrium is a quarter of an oscillation, so $T / 4 = 0.50$ s and $T = 2.0$ s.

Watch out: Returning to equilibrium once takes a quarter of a period, not half.

5 **A**

Length of a pulse on a spring · AQA June 2022 · AS Paper 2 · Q16

The pulse travels 4.0 m in 2.0 s, so $v = 2.0$ m s^{-1}. It took 0.40 s to create, so its length is $2.0 \times 0.40 = 0.8$ m.

Watch out: The 4.0 m is how far the pulse travels, not its length.

6 **A**

Circular wave in a beaker after 1.0 s · AQA June 2025 · AS Paper 2 · Q15

In 1.0 s the wave travels 150 mm. The beaker's radius is only 100 mm, so the wave reaches the side after 100 mm, reflects and travels another 50 mm back. Its radius is 100 − 50 = 50 mm and it is moving towards the centre.

> **Watch out:** Check the distance against the size of the container: 150 mm (C, D) would be outside the beaker.

How students did: In June 2025 this was one of the less successful questions, and a wrong answer was the most popular choice.

End of mark scheme. Answers from AQA's published keys; explanations written for this pack. AQA material is © AQA. More free packs and 1-to-1 tuition: **www.getbetteratphysics.co.uk**

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